

**Notice of Allowability**

Application No.

10/705,295

Examiner

DANIEL G MARIAM

Applicant(s)

SILVER ET AL.

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to a telephone interview dated September 1, 2004.
2. ☒ The allowed claim(s) is/are 121-180 (which are renumbered as 122-181).
3. ☒ The drawings filed on 10 November 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 11-10-2003
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 09012004.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

**DANIEL MIRIAM**  
PRIMARY EXAMINER

**DANIEL MIRIAM**  
CORRIGEND EXAMINER

## EXAMINER'S AMENDMENT AND ALLOWANCE

### Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Russ Weinzimmer (Reg. No. 36717) on August 26, 2004.

2. The application has been amended as follows:

Amend the specification as follows:

In page 2 of the amendment to the specification, under the heading Cross Reference to Related Applications", delete " , which is a continuation-in-part to U.S. Patent Application Serial Number 09/979,588, filed 11/26/1997 " - -

3. Please note, while applicants have canceled claims 1-120 of the originally filed claims by the amendment (See page 3 of the amendment), and have submitted newly added claims 121-180 (See pages 3-8 of the amendment), the originally filed claims in fact contain claims 1-121).

4. Cancel the originally filed claim 121.

5. Renumber the newly added claims **121-180 as 122-181, after the following amendments to the newly added claims have been entered.**

Amend claim 151 as follows:

At line 10, delete the limitation "adapted to" and replace it with "configured to" - -

Amend claim 152 as follows:

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At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 153 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 154 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 155 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 156 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 157 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 158 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 159 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 160 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 161 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 162 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 163 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 164 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 165 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

Amend claim 166 as follows:

At line 1, delete “method” and replace it with “apparatus”- -

#### **Allowance**

6. Claims 122-181 are allowed
7. The following is an examiner’s statement of reasons for allowance: none of the prior art of record determine a more accurate pose of an image boundary by solving a plurality of simultaneous equations, the plurality including an equation for each of a respective plurality of image boundary points of the image boundary, so as to provide a coordinate transform; and applying the coordinate transform to each of the image boundary points that maps the current pose P of the image boundary into a more accurate pose P' of the image boundary (and the coordinate transform being of the form  $P' = CP + t$ , where C is a matrix, and t is a translation vector). It is for these reasons and in combination with all of the other elements of the claims that renumbered claims 122-181 will be allowable over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

**Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**DANIEL MIRIAM**  
**PRIMARY EXAMINER**

September 1, 2004

## AMENDMENT TO THE SPECIFICATION

*At the top of the first page, before the first section, please insert:*

**-- Cross Reference to Related Applications**

*df*  
*df* This is a continuation of U.S. Patent Application Serial Number 09/746,147, filed <sup>now US Patent No. 6,658,145 issued on Dec. 2, 2003</sup> 12/22/2000, which is a continuation of U.S. Patent Application Serial Number 09/001,869, filed <sup>now abandoned</sup> 12/31/1997, which is a continuation-in-part to U.S. Patent Application Serial Number 09/979,588, filed 11/26/1997. --

*Please amend the paragraph beginning at page 58, line 13, as follows:*

In a preferred embodiment, the methods of ~~co-pending US patent application Serial No. \_\_\_\_\_, filed 11/14/97~~ US Patent No. 6,457,032, issued 9/24/2002, entitled "Efficient, Flexible Digital Filtering", and ~~co-pending US patent application Serial No. 08/727,721, filed 10/07/96~~ U.S. Patent No. 6,408,109, issued 6/18/2002, entitled "Apparatus and Method for Detecting and Sub-Pixel Location of Edges in a Digital Image" "Fast, Inexpensive, Subpixel Edge Detection" are used for feature extraction, Cognex Corporation's PatQuick™ tool is used to determine the starting pose, and the multi-resolution style of figure 26 is used. The following parameter settings are used for feature extraction by default. Many other strategies can be devised to suit specific applications.

*Please amend the paragraph beginning at page 59, line 2, as follows:*

where  $w$  and  $h$  are the width and height, respectively, of the pattern 100 in pixels and the floor function gives the largest integer that is less than or equal to its argument. Note that sub-sampling by  $n$  means taking every  $n^{\text{th}}$  pixel. The low-pass filter 310 uses a filter size parameter (" $s$ " in ~~co-pending US patent application Serial No. \_\_\_\_\_, filed 11/14/97~~ U.S. Patent No. 6,457,032, issued 9/24/02, entitled "Efficient Flexible Digital Filtering") equal to one less than the computed sub-sample amount. The Cartesian to polar conversion module 340 multiplies the gradient magnitude values by 2.0 to improve precision at the low end, where most gradient values lie.